MEMORANDUM

SUBJECT: Response to Public Comments on the Preliminary Risk Assessments for the Organophosphate Dimethoate

FROM: Patrick Dobak, Chemical Review Manager
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TO: OPP Public Docket for Dimethoate
Docket number OPP 34143B

Introduction

This document addresses public comments that were received in response to EPA's Notice of Availability in the Federal Register (63 FR 174, September 9, 1998) of preliminary risk assessments for the organophosphate dimethoate. Comments were received from the Registrant, the Cornell Cooperative Extension, the Consumers Union, NRDC, National Cotton Council, American Farm Bureau, Idaho, Farm Bureau Federation, Clemson University, and individuals who did not specify an affiliation.

Part I: Response to Comments Received from Cheminova

A. Response to Chemical-specific Comments on the Health Effects Assessment

1. Introduction

The following is the Agency's response to comments (Phase 4) for dimethoate generated in response to the document *Comments on EPA's Dimethoate Draft RED Chapters* (August 20, 1998) submitted by Cheminova Agro A/S and a letter (November 6, 1998) submitted by the Consumers Union in Phase 3 of the Public Participation Process. Some of the responses serve as clarification of Agency policies and guidance and it is hoped that this will provide a greater understanding of the Agency's position and procedures on the respective issues. The registrant needs to work with the Agency on changes and/or clarification of label language before a re-evaluation of the risk can be made. In addition, the Agency will need to work with the affected states (Special Local Needs) and the US Department of Agriculture (IR-4s) before use sites can be withdrawn from risk considerations.

Cheminova has indicated that it will generate the following data to provide additional studies for endpoint selection, dermal absorption, and tolerance reassessment. When submitted, the Agency will review the studies and revisit the toxicity endpoints and tolerances.

1. Acute dietary rat study with plasma, red blood cell, and brain cholinesterase (ChE) activity measurements. This study was not acceptable.

2. Dermal toxicity rat study which measures ChE activity within a time frame that corresponds with short-term occupational exposures. This study was incorporated into the occupational risk assessment.

3. 28-Day dermal toxicity rat study which measures ChE activity. This study is currently in review.

4. Storage stability of ^{14}C-omethoate. Expected submission date December 1, 1998.

5. Information to define the use patterns for the non-food/feed uses that Cheminova is supporting in reregistration. Submission date TBD.

2. SUPPORTED USE PATTERNS

a. Dimethoate registrations

Cheminova states that it will support a *wettable powder formulation* for use on grapes only. The wettable powder formulation includes a Special Local Needs (SLN) registration from California for rights-of-way application. California must be contacted to determine whether they wish to support this use pattern. Until an official response is received from California, EPA will retain its risk assessment for occupational handlers handling wettable powder formulations to support rights-of-way applications.

Cheminova states that it will not support any *ready-to-use* formulations. The ready-to-use formulation includes SLN registrations from Oregon, Washington, Idaho, and Utah for application in soil injection equipment for ornamental/shade trees. Holders of SLN registrations must be contacted to determine whether they wish to support this formulation. If all registrants agree to drop this formulation, EPA will drop this formulation-type from its risk assessment for occupational handlers.

b. Directions for Use

(1.) Application Methods

Cheminova states that it does not support an application method using a *high-pressure hand wand*. However, Cheminova indicates it is supporting use on outdoor and greenhouse ornamentals, including roses. High-pressure hand wand sprayers are often the equipment of choice for these use patterns. EPA is unaware of a practical method of eliminating this equipment and retaining the use pattern. A label prohibition statement is not an option, since the equipment is difficult to define in a way that end-users would understand.

Cheminova states that it does not support an application method using a *sprinkler can*. Soil drench applications to ornamental herbaceous plants are often applied by sprinkler can, particularly in greenhouse or outdoor bench nursery settings. This application method can be eliminated by a label statement prohibiting its use.

Cheminova states that it does not support aerial applications made in solutions of *less than 2 gallons* of finished spray per acre. All labeling where aerial application is feasible must be amended to indicate that aerial applications must be applied using at least 2 gallons of finished spray solution per acre.

Cheminova states that it will not support *chemigation* methods. Several SLN uses apparently allow application through chemigation. Holders of the SLN registrations must be contacted to determine whether they wish to support this application method. Until an official response is received from each of the other registrants (states), EPA will retain the chemigation use pattern in its risk assessment for occupational handlers.

Cheminova does not believe that prohibiting the use of *human flaggers* is justifiable. In addition, Cheminova believes that the exposures to flaggers are relatively low. The most recent occupational risk assessment (12/16/99) indicates that flagger exposure is of concern at use rates of 4 lbs/ai/acre and higher, assuming the use of engineering controls (enclosed cab).

(2.) Supported Use Categories, Uses, and Use Patterns

(a.) Supported use Categories and Uses

Cheminova believes that the Agency should require all technical and end-use registrants to commit to the same uses and use rates as proposed by Cheminova, since all rely on Cheminova's data. The Agency will contact other technical and end-use registrants to determine whether they wish to support any uses or use rates not being supported by Cheminova.

Cheminova states that it will not support any *indoor food uses, except in greenhouses*; will not support use in *agricultural buildings*, *dermal application* to dairy or meat animals, or *food processing plant premises/equipment*. The Agency will contact other technical and end-use registrants to determine whether they wish to support any uses not being supported by Cheminova.

Cheminova states that it will not support any *indoor non-food uses, except ornamentals* in greenhouses; will not support treatments to *premises and equipment at commercial, institutional, and industrial sites*. The Agency will contact other technical and end-use registrants to determine whether they wish to support any uses not being supported by Cheminova.

Cheminova states that it will not support aquatic uses (i.e., *sewage systems*). The Agency will contact other technical and end-use registrants to determine whether they wish to support any uses not being supported by Cheminova.

Cheminova states that it will not support *residential use*, including home ornamentals and residential lawns. The Agency will contact other technical and end-use registrants to determine whether they wish to support any uses not being supported by Cheminova.

Cheminova states that it will not support any *forestry uses* for dimethoate; only treatments to nursery stock are being supported. Several SLN registrations including ones from Tennessee (Christmas Tree Plantations); Oregon and Washington (cottonwood); Maine, Minnesota, and North Carolina (ornamental and/or shade trees); and Hawaii (ornamental herbaceous plants) have an application rate listed per acre and/or list aerial equipment as an application method. Holders of these SLN registrations must be contacted to determine whether they wish to support the forestry use pattern. Until an official response is received from each other registrant, the Agency will retain the forestry use pattern (i.e., aerial application to trees) in its risk assessment for occupational handlers.

(b.) Supported Use Patterns - Food/Feed Uses

In a letter dated 5/21/97, Cheminova identified the maximum use rates for dimethoate on food/feed crops that they will support under reregistration. Excluding those uses on food/feed crops which the registrant does not intend to support (i.e. Brussels sprouts, alfalfa grown for seed, grass grown for seed, blueberries, cowpeas, asparagus, and tobacco), the registrant is proposing maximum use rates of dimethoate on field corn, wheat, grapefruit, lemons, oranges, tangerines, watermelon, alfalfa, apples, potatoes, and cherries which are different from the maximum use rates considered in the development of the Residue Chemistry Chapter for the Dimethoate RED document and preliminary risk assessments. No residue data were submitted in conjunction with the registrant's proposal (letter dated 5/21/97). A summary of the differences in maximum use rates is provided in the Maximum Use Rate Table -Appendix 1.

The registrant is proposing lower maximum single application rates of dimethoate on *grapefruit, lemons, oranges, tangerines* (0.5 lbs ai/A citrus), *and cherries (0.33 lbs ai/A)* and a longer pre-harvest interval (PHI) on apples than those considered in the development of the Residue Chemistry Chapter for the Dimethoate RED document and preliminary risk assessments. Although these proposed maximum use rates could result in lower total maximum residues of dimethoate and omethoate, available field trial data are not adequate to support lowering tolerances to reflect the proposed application rates.

It should also be noted that numerous SLN registrations exist for the use of dimethoate on *cherries* at the maximum use rates considered in the development of the Residue Chemistry Chapter for the Dimethoate RED document and preliminary risk assessments and it is uncertain, at this time, if the subject SLNs may be amended to the lower maximum single application rate as proposed by the registrant. Field trial data are not required to support these proposed use rates. The Agency will contact other technical and end-use registrants to determine whether they wish to support any uses not being supported by Cheminova. SLNs from Washington, Montana, Oregon, and Utah list the application rate on cherries as high as 2.0025 lb/A. These states must be contacted to determine whether they wish to support this application rate. The Agency notes, however, that according to the handler risk assessment, the 0.33 lb/A use rate would remain of concern for mixers/loaders supporting aerial applications, but would not be of concern for mixers/loaders supporting airblast equipment and for applicators using airblast equipment.

A SLN from Arizona lists the application rate on *citrus* as 2.0 lb/A. Arizona must be contacted to determine whether they wish to support this application rate. In any case, no change in the handler risk assessment is required since a range of application rates was used (0.25, 0.5, 2.0, and 4.0 lb/A), including the 0.5 lb/A rate. The Agency notes that at the 0.5 lb/A application rate, the handler risks were of concern even with the use of engineering controls (closed systems) for mixers/loaders handling emulsifiable concentrate formulations to support aerial, groundboom, and airblast applications. For the purposes of dietary risk assessment and tolerance reassessment the Agency assumed a maximum use rate for dimethoate on *citrus* as follows: two foliar applications per growing season to mature grapefruit, lemons, oranges, and tangerines at 2 lb

ai/A/application with a 15-day pre-harvest interval (PHI). In a letter dated 5/21/97, the registrant indicated that they proposed to support a lower maximum single application rate (0.5 lb ai/A/application) for dimethoate on citrus; however, residue data were not submitted in conjunction with the proposal. Further evaluation of the available citrus field trial data indicate that they are not adequate to support lowering the currently established tolerances for total residues of dimethoate and omethoate in/on grapefruit, lemons, oranges, and tangerines (2 ppm) to reflect the proposed lower single application rate. The registrant should submit residue data to support the proposed lower maximum use rate for dimethoate on grapefruit, lemons, oranges, and tangerines.

Cheminova states that it is not supporting the use on *Brussels sprouts, alfalfa grown for seed, or grass seed/hay/forage*. However, IR-4 has submitted residue data for these uses.

Cheminova states that it will support a maximum use rate of 0.16 pounds per acre for *peas.* A revised handler risk assessment is not necessary to reflect this use pattern. Risks for mixers/loaders supporting groundboom applications and for applicators using groundboom equipment are not of concern at the 0.25 lb/A application rate and would, therefore, not be a concern at any lower application rate. The risks for mixers/loaders supporting aerial applications are of concern at the 0.25 lb/A rate even with the use of engineering controls (closed systems) and would remain of concern even if the 0.25 lb/A rate were halved (0.125 lb/A). Therefore, risks for mixers/loaders supporting aerial application would also be of concern at the 0.16 lb/A application rate on peas. For the purposes of dietary risk assessment and tolerance reassessment the Agency assumed a maximum use rate for dimethoate on peas as follows: one foliar application per growing season to peas at 0.16 lb ai/A/application with a 0-day pre-harvest interval (PHI). No additional field trial data are required to support this maximum use rate for dimethoate on peas (including field peas).

Cheminova states that it will support a maximum use rate on *pecans* of 0.33 lb/A. A SLN registration from California lists a 0.66875 application rate for pecans. California must be contacted to determine whether they wish to support this application rate. The Agency notes, however, that according to the handler risk assessment, the 0.33 lb/A use rate would remain of concern for mixers/loaders supporting aerial applications, but would not be of concern for mixers/loaders supporting airblast equipment and for applicators using airblast equipment. For the purposes of dietary risk assessment and tolerance reassessment the Agency assumed a maximum use rate for dimethoate on pecans as follows: one foliar application per growing season to pecans at 0.33 lb ai/A/application with a 21-day pre-harvest interval (PHI). No additional field trial data are required to support this maximum use rate for dimethoate on pecans. A SLN registration (GA82000100) exists which permits up to two applications at 0.66 lb ai/A with a 21-day PHI; the Agency (memo by E. Zager dated 1/5/82) has determined that total residues of dimethoate and omethoate in/on pecans are not likely to exceed the currently established tolerance for total residues of dimethoate and omethoate in/on pecans (0.1 ppm) resulting from this SLN use.

The registrant is proposing a higher maximum single application rate (0.67 lbs ai/A) and a longer PHI on *wheat* than those considered in the development of the Residue Chemistry Chapter for the Dimethoate RED document and preliminary risk assessments. Available magnitude of the residue data indicate that total residues of dimethoate and omethoate in/on wheat raw agricultural commodities (RACs) resulting from the proposed use rate of dimethoate on wheat are not likely to exceed the reassessed tolerance levels specified in the Residue Chemistry Chapter for the Dimethoate RED document. However, the available field trial data are not adequate to support lowering tolerances to reflect the proposed application rate. Field trial data are not required to support this proposed use rate. The Agency will contact other technical and end-use registrants to determine whether they wish to support any uses not being supported by Cheminova. A SLN from Washington lists the application rate on wheat as 2.67 lb/A. Washington must be contacted to determine whether they wish to support this application rate. In any case, no change in the handler risk assessment is required since a range of application rates was used (0.25, 0.5, 2.0, and 4.0 lb/A), including a 0.5 lb/A rate. The Agency notes that at the 0.5 lb/A application rate, the risks were of concern even with the use of engineering controls (closed systems) for mixers/loaders handling emulsifiable concentrate formulations to support aerial applications.

The registrant is proposing shorter post harvest intervals (PHIs) for the use of dimethoate on *field corn grain, watermelon, alfalfa, and potatoes* than those considered in the development of the Residue Chemistry Chapter for the Dimethoate RED document and preliminary risk assessments . Although these proposed maximum use rates could result in higher total maximum residues of dimethoate and omethoate, available field trial data are adequate to demonstrate that total residues of dimethoate and omethoate in/on these RACs resulting from the proposed use rates of dimethoate are not likely to exceed the reassessed tolerance levels specified in the Residue Chemistry Chapter for the Dimethoate RED document. Field trial data are not required to support these proposed use rates.

(b.) Supported Use Patterns - Non-Food/Feed Uses

Cheminova states that it will support the use of dimethoate for several *ornamental* uses and will provide the Agency with information about these use patterns at a later date. Since these use patterns are not yet defined, no changes will be made to the handler risk assessment at this time. Since the use pattern for ornamental and/or shade trees lists an application rate of 1 lb/100 gal, and often 400 gallons are applied per acre with groundboom equipment, this application rate may be 4 lb/A. Since groundboom and aerial equipment are listed for this use pattern, the Agency will retain the 4.0 lb/A application rate in its handler risk assessment at this time.

Cheminova states that it will support the use on *pinyon pine* only in nursery stock; not as a forestry use. See forestry uses above.

Cheminova states that it will support use of dimethoate on *Christmas tree plantations* only as a spot treatment. See forestry uses above. The Agency requests clarification about the types of equipment that would be used for spot treatments on Christmas tree plantations.

Based on the available magnitude of the residue data, total residue levels of dimethoate and omethoate in/on meat, milk, poultry, or eggs resulting from potential dermal exposure to dimethoate from the currently registered uses of dimethoate as 1% or 2% livestock *premise treatments* are not expected to exceed those levels resulting from oral exposures to dimethoate from the maximum theoretical dietary burdens. Test sample storage intervals/conditions information is required to validate existing livestock magnitude of the residue data. Storage stability data depicting the stability of dimethoate residues of concern in meat, milk, poultry, and eggs are required. These data should reflect test sample storage intervals and conditions from the available magnitude of the residue data.

3. TOXICOLOGY

a. General

Cheminova agrees with the Agency's conclusions that dimethoate should be classified as a Group C carcinogen.

The Consumers Union disagrees with the Agency's decision to remove the additional Food Quality Protection Act (FQPA) 10X safety factor. The Hazard Identification Assessment Review Committee (HIARC) and the FQPA Safety Factor Committee determined that for dimethoate, the 10X factor, used to account for enhanced sensitivity of infants and children (as required by the Food Quality Protection Act), should be removed. This conclusion was based on the developmental and reproductive toxicity studies in the toxicology database for dimethoate in which there does not appear to be any special sensitivity for pre- or post-natal effects.

b. Study Design, Study Results, and/or Missing Data

(1.) Acute Toxicity Data

Cheminova believes that, where available, acute toxicity studies (acute oral, acute dermal, primary eye irritation, dermal irritation) conducted with Cheminova's 96-98% active ingredient (ai) technical material should be used instead of studies conducted with a 95% ai material. The Agency agrees that the studies conducted with the higher ai should be included when reassessing the risk of dimethoate. The Agency has reviewed the studies and classified them as acceptable/guideline studies. The new data are included in the table below.

Acute Toxicity Values - Dimethoate Technical

Test	Results	Toxicity Category
81-1: Oral LD_{50}; Rat; MRID No. 00164219 dimethoate (96-98% technical)	LD_{50}= 387 mg/kg	II
81-2: Dermal LD_{50}; Rabbit; MRID No. 00164220 dimethoate (96-98% technical)	LD_{50} > 2.0 g/kg	III
81-3: Inhalation LC_{50}; Rat; MRID No. 00060719; dimethoate (95% technical)	LC_{50} > 2 mg/L	IV
81-4: Primary Eye Irritation; Rabbit; MRID No. 00164222; dimethoate (96-98% technical)	Corneal opacities, iritis, and conjunctivitis; reversible within 7 days.	III
81-5: Primary Dermal Irritation; Rabbit; MRID No.:00164221 dimethoate (96-98% technical)	Not a dermal irritant	IV
81-6: Dermal Sensitization; Guinea pig; MRID No. 254924 dimethoate (97.3% technical)	Not a skin sensitizer	N/A
81-7: Acute delayed neurotoxicity study; hens MRID No. 42884401, dimethoate (96.42% a.i.)	No clinical signs of acute delayed neurotoxicity and no compound-related histological changes in nerve tissue.	N/A
81-8: Acute oral neurotoxicity screen study; rats MRID No. 42865102, dimethoate (99.1% a.i.)	Systemic effects NOAEL=20 mg/kg Systemic effects LOAEL=200 mg/kg based on a decrease in body weight. Neurotoxicity toxicity NOAEL =2 mg/kg/day Neurotoxicity toxicity LOAEL=20 mg/kg/day based on an absence of pupil response. At 200 mg/kg the most obvious reactions were tremors, decreased motor activity, decreased body temperature, increased catalepsy time and eleven other parameters which indicated that coordination, sensory and motor systems were affected. These effects were noted immediately following treatment and were reversed by day 7. There were no neuro-histopathological effects in either the central or peripheral nervous systems.	N/A

(2.) Acute Delayed Neurotoxicity Study in Hens

In the draft HED chapter and the HIARC document, the Agency stated that "Cholinesterase (ChE) activities were not measured." This statement is incorrect. Brain ChE, and brain and spinal cord neuropathy target esterase (NTE) were measured in the referenced study, Acute Delayed Neurotoxicity Study in Hens (MRID 42884401). This study showed that brain ChE was greatly decreased and brain NTE was slightly decreased relative to controls, and spinal cord NTE was consistent with control values.

Cheminova strongly disagrees with the statement in the HIARC document that a confirmatory NTE study is needed. The Agency does not require that a confirmatory NTE study to be done, as stated in HED RfD/Peer Review Report of Dimethoate (dated June 14, 1995, p.4). The Agency recommended that further study be conducted to fully characterize the time course of NTE inhibition following an acute exposure. The Agency stated that the acute delayed neurotoxicity study in hens (81-7, MRID No. 42884401) was considered to be acceptable and that the data evaluation record (HED Doc. No. 010684) was considered to be adequate.

(3.) Mutagenicity

Cheminova conducted an *in vivo* Unscheduled DNA Synthesis (UDS) study (MRID 42082001) which was negative for mutagenic effects. This study, which was submitted to EPA on November 6, 1991, was not included in the mutagenicity section of the draft HED chapter. The *in vivo* UDS study (HED Doc. #008968) should have been included in the draft HED chapter with the following statement:

Dimethoate was negative for inducing UDS in hepatocyte cultures from rats (males only). In this study dimethoate was administered by oral gavage at dose levels up to a clinically toxic dose of 200 mg/kg. However, the Agency classified this study as unacceptable since no evidence was available to assure transport of the test article to the target tissue (hepatocyte).

In the third paragraph on page 12 of the draft human health chapter, there is an error in the dose levels tested for which there was a positive response in the UDS assay. The correct dose levels should read "23 to 2290 ug/ml" instead of "229 to 2290 ug/ml."

4. ENDPOINT SELECTION

a. Acute Dietary Exposure

Cheminova believes that using a subchronic study to assess acute dietary concerns is inappropriate. The acute dietary endpoint and no-observable-adverse-effect-level (NOAEL) of 0.06 mg/kg, based on cholinesterase inhibition (ChEI), was selected from a subchronic neurotoxicity study in the rat. The *Hazard Identification - Toxicology Endpoint Selection Process* guidance document (August 11, 1998) provides the Agency's guidelines used in toxicology endpoints selection by the Hazard Identification Assessment Review Committee (HIARC) for acute and chronic dietary, as well as occupational and residential risk assessments. For each exposure scenario, guidance is provided for: 1) evaluation of toxicity studies that are relevant for use (i.e., route and duration of the study being similar to the exposure duration of interest); 2) selection of appropriate endpoints for hazard identification (i.e., doses and endpoints that best define the potential hazard in association with the exposure scenario); 3) the process for hazard identification (i.e., use of a weight-of--evidence type approach in which all available studies are considered together as opposed to the results of a single study); 4) the influence of

dermal absorption in hazard identification; 5) the criteria for the use of NOAEL, LOAEL, and the appropriate endpoints in the hazard identification process; and 6) the use of margins of exposure (MOEs) in risk assessments.

The objective is to identify an acute hazard (dose and endpoint) based on the toxic effects observed in a study following a single oral exposure (dose) of the pesticide to establish an Acute Reference Dose (Acute RfD), or Acute NOAEL as was the case prior to release of the guidance document. When an appropriate or acceptable single-dose study is not available, subchronic, chronic, or reproductive toxicity, or carcinogenicity studies (conducted via the oral route) may be used if the acute hazards can be identified to have occurred during the first few days of the treatment and therefore, are appropriate for extrapolation.

In the case of dimethoate, the Toxicity Endpoint Selection (TES) Committee, had originally selected 2.0 mg/kg/d from the submitted acute neurotoxicity study in the rat as the NOAEL for the acute dietary endpoint based on absence of pupil response at 20 mg/kg/d (02/97). Although the endpoint was revisited and is now based on a weight-of-evidence approach, the enpoint remained unchanged.

Cheminova has indicated that they will conduct an acute dietary rat study with plasma, RBC, and brain ChE activity measurements. This study was reviewed and was considered to be unacceptable.

b. Chronic Dietary Exposure

Cheminova agrees with the Agency's selection.

c. Short-term Occupational/Residential Exposure

Cheminova believes that using a 13-week dietary study to assess short-term dermal worker exposure (defined as 1-7 days) is inappropriate. Cheminova will soon conduct a dermal toxicity rat study which measures ChE activity within a time frame that corresponds with short-term occupational exposures.

Per guidance found in the *Hazard Identification - Toxicology Endpoint Selection Process* guidance document, the guideline study that is most directly applicable to this route (dermal) and exposure period of concern (1-7 days), is the 21-day dermal toxicity study. In the absence of an appropriate 21-day dermal toxicity study or other dermal studies, toxicity studies in which the route of administration is oral may be used for short-term hazard identification. If an oral study is used for dermal exposure risk assessment, the magnitude of dermal absorption is ascertained and a dermal absorption factor is identified for route-to-route extrapolation. If the toxicity profile of the pesticide indicates concerns for toxicological effects not evaluated in the 21-day study (e.g., neurological or developmental effects), then a weight-of-evidence approach is used in which all available studies (oral and dermal) are considered concomitantly for endpoint selection.

Range-finding (if available), subchronic (oral or dermal), chronic and/or reproductive toxicity (oral) studies are used if treatment-related toxic effects appear early and are most appropriate to extrapolate for short-term exposures. Endpoints that can be used from these studies include effects that appear to occur early in the study (i.e., within 1-7 days). Early indications of effects in subchronic studies might include, but are not limited to, cage-side observations, hematology (e.g., anemia), clinical chemistry (indicate development of abnormal pathology) and histopathology (pre-neoplastic lesions) data.

For dimethoate, the HIARC selected the same endpoint and NOAEL that was selected for the acute dietary RfD. The rationale is provided above.

d. Intermediate-term Occupational/Residential Exposures

Cheminova objects to the Agency's selection of endpoints/NOAELs from an oral subchronic neurotoxicity study for assessing intermediate-term risk. Cheminova argues that in many cases, exposure will not occur for a length of time approaching that represented by endpoint and NOAEL observed in the subchronic (90 days) study. While the Agency defines intermediate term exposure as continuous exposure for periods ranging from 7 to several months, in many cases the actual intermediate-term exposure is closer to 7 days, and this should be reflected in the risk assessment endpoints/NOAELs selected. The Agency believes that it has chosen an endpoint/NOAEL consistent with potential human exposure durations to the extent possible considering the available data and the need to assure protection for persons exposed for the longest potential exposure duration. The reasons for selecting the endpoint/NOAEL from the subchronic study are discussed below.

If use patterns for a pesticide indicate a potential intermediate-term exposure scenario, the Agency will choose an endpoint/NOAEL which most closely reflects the length of time (7 to several months) during which continuous exposure is expected. For example, if the exposure duration is expected to be closer to 21 days, the Agency will look for an endpoint/NOAEL near 21 days. If the exposure duration is expected to be closer to several months, the Agency will look for an endpoint/NOAEL near several months. However, the endpoint/NOAEL selected must be protective for the people likely to be exposed for the longest period of time. Therefore, if exposure could occur, for example, over a 35-day time period, the endpoint/NOAEL selected for this risk assessment must reflect an exposure duration of approximately 35 days or greater in order to be protective for all potential exposures.

Toxicity studies from which endpoints/NOAELs are typically chosen for intermediate-term dermal risk assessment include developmental studies (dosing period ca. 9 days for rats, 12 days for rabbits), 21-day dermal studies (dosing period 21 days), subchronic oral studies (dosing period ca. 90 days), and reproduction studies (dosing period 6-8 months per generation). As stated above, for selection of an endpoint/NOAEL for intermediate-term risk assessment, the Agency will look for the study in which the length of dosing most closely approximates human exposure to the pesticide *without underestimating potential risk.* Therefore, if the appropriate toxicity

parameters are measured in the 21-day dermal study, the endpoint/NOAEL from this study will frequently be selected for the intermediate term risk assessment because many intermediate term exposures are in the range of 21 days. However, if intermediate-term exposure is expected to be significantly greater than 21 days, or if important endpoints are not measured in the 21-day study (e.g., cholinesterase inhibition), then an endpoint/NOAEL from another study must be selected. This will typically be the subchronic oral toxicity study since it represents the next step up in terms of dosing duration from the 21-day study. There are usually no other studies from which an endpoint/NOAEL could be selected which would reflect the maximum exposure duration for humans in the range of 21 days to several months.

Therefore, while the Agency agrees that the endpoint/NOAEL selected for intermediate term risk assessment may in some cases reflect a longer animal dosing period than the human exposure duration for which the risk assessment is being done, selection of these endpoints is necessary considering the data available and the Agency's mandate of protecting the most highly exposed people.

Cheminova has submitted a 28-day dermal toxicity rat study which measures ChE activity. It is currently under review.

e. Long-term Occupational/Residential Exposures

The Agency did not conduct a long-term occupational risk assessment for workers because expected exposures did not warrant it. However, a NOAEL and endpoint of 0.05 mg/kg was selected from the chronic toxicity/oncogenicity rat study should the use patterns change.

f. Inhalation Exposure

Cheminova believes that inhalation exposure can be accounted for in the risk assessment by comparing the dermal exposures to a dermal NOAEL and inhalation exposures to an oral toxicity NOAEL. The Agency is using the subchronic dietary neurotoxicity study for the short- and intermediate-term exposure risk assessment.

The Agency's current toxicology data requirements, are limited to the acute (§81-3) and subchronic (§82-4) toxicity studies. The acute study is not recommended for use in risk assessments since this study is conducted primarily to determine the inhalation LC_{50} values from which a Toxicity Category is assigned to provide information necessary for determining appropriate language for precautionary labeling. Therefore, the choice of study for this exposure assessment is limited to a subchronic toxicity study of any duration (14, 21 or 90-days). Also this study then can be used for inhalation exposure risk assessments for any time period (Short-, Intermediate-, or Long-Term).

When there is a concern for potential inhalation exposure (based on the use pattern) and

there are no inhalation toxicity studies (except for the acute LC_{50} study) available in the database, the Hazard Identification Assessment Review Committee (HIARC) is left with no option but to resort to the use of an oral NOAEL for inhalation risk assessments (i.e., route-to-route extrapolation). While it is generally recognized that route-to-route extrapolations should be avoided, in the absence of appropriate inhalation toxicity studies, route-to-route extrapolation overcomes the obstacle of inadequate data by allowing one route to substitute for another and provides a way to combine risk for multiple routes.

When route-to-route extrapolations are needed: 1) the inhalation exposure (µg/lb a.i) and the dermal exposure (mg/lb a.i) are converted to oral equivalent doses (mg/kg); 2) the converted oral equivalent doses are combined to achieve a combined dose for total (dermal + inhalation) exposure; and 3) this combined dose is then be compared with the oral NOAEL to calculate the Margins of Exposure (MOEs).

g. Dermal Absorption Factor

Cheminova disagrees with using an 11% dermal absorption factor and the NOAEL from the oral subchronic neurotoxicity to assess risks from short- and intermediate-term dermal exposures. Cheminova believes that data from a subchronic dermal toxicity rat study, that Cheminova intends to conduct, should be used instead. In the interim however, Cheminova believes that an absorption factor of 8.2% from the same dermal absorption rat study used to select 11% after 5 days of dosing, should be used because this is the average percent absorption measured at day 1 after dosing.

In determining dermal absorption, the Agency considers the weight-of-evidence approach including dermal absorption studies as well as comparison of the dermal and oral studies. Some factors that effect percent dermal absorption include: application site; the type and amount of vehicle used; total time of application; total dose applied; and the distribution of the administered dose (e.g., quantity in skin wash and on the protective cover, material remaining in or on the washed skin, material in selected organs, if collected, and the residue in the carcass). When dermal absorption studies are available, the HIARC reviews the data and selects the dermal absorption value (percent) reported for a 8-10 hour period, the time period that reflects an average work day for the pesticide handlers (mixer/loader/applicator). Because dermal absorption was not measured in the dermal rat study 8-10 hours post treatment, the HIARC recommended the use of the highest percent dermal absorption value (11%).

5. OCCUPATIONAL AND RESIDENTIAL EXPOSURE

a. High Exposure Application Methods

Cheminova states that it does not support application with a paint brush. The Agency will contact other technical and end-use registrants to determine whether they wish to support any uses not being supported by Cheminova. The paint brush application is currently listed as an

application method on ready-to-use formulations for treating bark on ornamental/shade trees.

Cheminova states that it does not support use of emulsifiable concentrate formulation on grapes due to phytotoxicity concerns; it supports use of wettable powder formulation on grapes. Washington has a SLN registration for the emulsifiable concentration on grapes at an application rate of 2.0 lb/A. Washington must be contacted to determine whether they wish to support this use pattern. In any case, no change to the handler risk assessment is required, since the 2.0 lb/A application rate for emulsifiable concentrates is already included in the assessment for other crops/use patterns.

b. Handler Exposure Assessment

Cheminova believes exposure would be more accurately estimated using the PHED database version 1.1 of March 1995. The Agency estimated exposure using the May 1997 version of PHED database version 1.1 (June 19, 1998).

Cheminova believes that the default acreage treated requires some refinement and anticipates that refinement of application rates and acreage will have a significant effect on daily exposure estimates, but defers addressing the concerns until completion of dermal toxicity study.

6. Dietary Exposure

a. Dietary Exposure from Food

(1.) Directions for Use; Animal Metabolism

No comment needed.

(2.) Residue Analytical Methods - Plants and Animals

Confirmatory radiovalidation data from the livestock metabolism studies were received December 21, 1998 and are in review.

(3.) Storage Stability

No additional plant storage stability data or test sample storage information are required. All references should be changed to reflect this.

Cheminova has indicated that it will provide data for the storage stability of ^{14}C-omethoate. Expected submission date was December 1, 1998. As of this writing, no submission has been received.

No Dimethoate storage stability data have been submitted indicating the stability of

Dimethoate residues of concern in meat, milk, poultry, and eggs. These data remain outstanding and are considered confirmatory.

Test sample storage intervals/conditions information is required to validate existing livestock magnitude of the residue data. This information is not currently available for the livestock magnitude of the residue data submitted for Dimethoate tolerance reassessments. This information is vital to conducting Dimethoate tolerance reassessments. In addition, since meat, milk, poultry, and eggs exposure estimates are based on magnitude of the residue data, test sample storage information from these studies would dramatically increase our confidence with respect to exposure estimates for these commodities. This information remains outstanding and is considered confirmatory. The registrant has provided some test sample storage information to support poultry magnitude of the residue data (MRID 44382501), which are under review.

(4.) Magnitude of the Residue

In a letter dated 5/21/97, Cheminova indicated that they will not support the use of dimethoate on *cowpeas*. If another party wishes to support the use of dimethoate on cowpeas then, bean forage and hay data reflecting the proposed maximum use rate for dimethoate on beans are required and tolerances must be proposed.

It should be noted, however, that given the current use profile for dimethoate, the Agency considers the potential contribution from *bean forage and hay* to secondary residues of dimethoate and omethoate occurring in meat, milk, poultry, and eggs as inconsequential. Hence, maximum potential residues of dimethoate and omethoate in/on bean forage and hay have not been, nor are they likely to be, included in maximum theoretical livestock dietary burden calculations used to estimate exposure from dimethoate and omethoate in meat, milk, poultry, and eggs.

Data waivers were received by the HED residue chemist for sorghum stover (fodder) and wheat germ December 30, 1998, were reviewed and found to be acceptable.

b. Dietary Exposure from Drinking Water

The Agency does not have concerns for dietary exposures from drinking water since the estimates derived from models are low. The Consumers Union believes that a 10X safety factor should be retained based on lack of monitoring data. The Environmental Fate and Effects Division's (EFED) screening-level assessments with the GENEEC and SCI-GROW models use the highest label application rate for a pesticide to provide worst-case estimates in surface and ground water. Even with the refinements provided in the PRZMS/EXAMS model, the estimates are still considered over-estimates and screening level. In the case of dimethoate, the model estimates indicated low drinking water exposures. Limited available monitoring data indicates water levels below EFED's modeling estimates. HED considers the drinking water risk assessment using the over-estimates from models protective of any potential exposures to

dimethoate from water. Specific comments about the derivation of the drinking water estimates will be addressed by the EFED.

The Agency does consider all children's age groups in the risk assessment but only includes the group with the highest exposure from food for a given pesticide in the risk assessment document. In the case of dimethoate, this should have been non-nursing infants < 1 year. However, the calculated exposures and resulting drinking water risk assessment are the same since the current Agency default body weight and consumption value are 10 kg and 1 litre/day for all infants and children. These default values and others are presently under review in the Agency. If at a future time the Agency decides to change the default assumptions used, the impact of the changes on the dimethoate risk assessment will be considered.

c. Dietary Risk Assessment and Characterization

(1.) Chronic Dietary Risk Assessment

Unless the Agency receives notice from the subject states or the U.S. Department of Agriculture (USDA) to cancel uses on certain crops, all current Special Local Needs (SLNs) and IR-4s, respectively, will be included in the dietary risk assessment.

(2.) Acute Dietary Risk Assessment

Cheminova submitted an acute dietary exposure assessment for dimethoate using a Monte Carlo (MC) analysis. The exposure assessment has been reviewed by HED (Mohsen Sahafeyan, January 1999). Even with inappropriate assumptions on the part of registrant and inadequacies in the submission, HED's recalculated margin of exposure (MOE) values based on the most recent NOAEL of 0.06 mg/kg/day (instead of an earlier NOAEL of 2.0 mg/kg/day used by the registrant) ranged from 3-8 (MOE of >100 is required) at the 99.9^{th} percentile; thus, exposure exceeds HED's level of concern. Several deficiencies in the assessment were noted. These include: the use of the old NOAEL value (2.0 mg/kg/day) instead of the recent one (0.06 mg/kg/day as per the decision of HIARC in July of 1998), inappropriate exclusion of specific commodities in the analysis, inappropriate use of PDP data for single-serving and blended/mixed commodities, inappropriate assumption of residue concentration of omethoate (zero) when it was not analyzed in PDP data, and lack of a hard (or electronic) copy of some residue data files. Therefore, substantial refinement and mitigation is necessary for the acute dietary risk assessment.

d. Tolerance Reassessment

The Consumers Union believes that some of the tolerances should be lowered or eliminated. The proposed tolerance reassessments included in the subject preliminary risk assessment for dimethoate are consistent with Agency Guidelines for determining the maximum total residues of dimethoate and omethoate likely to be present in or on raw agricultural commodities (RACs) and processed foods resulting from currently registered (or proposed)

maximum use rates of dimethoate. At this point, tolerance residue levels are based on available magnitude of the residue data reflecting currently registered (or proposed) maximum use rates of dimethoate to determine the maximum total residues of dimethoate and omethoate likely to be present in or on RACs and processed foods at the point at which they enter commerce. While monitoring data may be useful for refining anticipated residue estimates closer to the point of consumption, they cannot be used to determine the amount of a pesticide residue that legally may be present in or on a RAC or a processed food entering commerce.

B. Response to Cheminova's Comments on the Ecological Fate and Effects Assessment

1. Introduction

The risk assessment developed by Clifford Habig, PhD. of Jellenik, Schwartz and Connoly, Inc. Authorized Representative of Cheminova Agro A/S is referred to by Habig as a Tier II risk assessment. The Agency reviewed the assessment and has identified some problems with the registrants approach to risk assessment.

The Agency notes the following regarding the registrant's November 9, 1998 risk evaluation:

1- They depended solely on a time-weighted average of mean nomograph EECs, while the Agency risk assessment utilizes the full range of exposures based on the Kenega nomograph as modified by Fletcher, 1994. The Agency does not dispute the value of incorporating time weighted averages of mean EECs, however, that approach misses the risk associated peak residue levels. It is essential that sublethal and reproductive risk be characterized in terms of both peak, and time-dissipated residues. The avian reproductive testing does not allow a differentiation between sublethal or reproductive effects that are triggered by long-term exposure and those triggerred by short-term exposure. It is considered that the longer the NOEL is likely to be exceeded in the field, the greater the opportunity for hazardous exposure. Based on Agency' s estimations, not only short-term upper-limit exposure estimates exceed the LOC, but also long-term time-weighted average exposure exceed the avian reproductive NOAEL. Thus, the Agency disagrees with the registrants conclusions that reproductive or sublethal risk is minimal.. The Agency concludes that the potential for sublethal or reproductive risk to birds and mammals from dimethoate is moderate.

2- They disagree with the avian reproductive endpoint used in the risk assessment. The Agency had four avian reproduction tests available from which to determine potential sublethal or reproductive hazard to birds.

Avian Reproduction

Species/Study Duration	% ai	NOEC (ppm)	LOEC	Endpoints	MRID No.	Author/Year	Study Classification
Northern Bobwhite (Colinus virginianus) 147 days	99.1	4.0	35.4 ppm	reduced egg production, viable embryos, 3-week old embryos, normal hatchlings, 14-day old survivors, 14-day old survivor weight, adult male and female body weight, and egg shell thickness	44049001	Gallagher et al./1996	Core
			10.1 ppm	reduced 14-day old survivor weight			
Northern Bobwhite (Colinus virginianus) 196 days	96.7	6	30 ppm	Reduced number of normal hatchlings, and increased number of cracked eggs	00162777	Munk/1986	Supplemental[1]
Mallard (Anas platyrrhinchos)154 days	97.3	< 30	NA	No significant effects due to low egg production in all treatment groups including the control	00159768	Munk/1986	Supplemental[2]
Mallard duck (Anas platyrhynchos) 154 days	99.1	35.4	152 ppm	Reduced egg production, viable embryos, viable 3-week old embryo, normal hatchlings, 14-day old survivors, and adult female body weight.	43967101	Gallagher et al./1996	Core

[1] Rated 'Supplemental' because of questionable study design and incomplete data

[2] Rated 'Supplemental' because of low egg production in all treatment and control groups. No eggs were laid in 2 out of 6 control pens.

The Agency choose the Gallagher et al (1996) study, with a NOAEL of 4 ppb based on reduced 14-day old survivor weight. Reduced weight of young birds in the field is potentially ecologically significant, as it might reduce ability of the young to survive to maturity.

The registrant selected the 10.1 ppm test level because they felt the effects to the young were inconsequential. The Agency agrees that more adverse effects were noted at the 25.4 ppm test level; however, the 4 ppm NOAEL is the appropriate toxicity threshold against which to compare EECs.

3- The registrant referred to actual field monitoring on which to base residues on insects. Their estimates of residues on insects were substantially lower than Agency's. The registrant further feels that Agency is in error to use the nomograph values for seeds to estimate insect residues. The Agency, operationally, uses the nomograph EEC for seeds as a surrogate for small insects based on a similar surface area to volume ratio. The Agency is aware the neither Kenega nor Fletcher actually collected residue data for insects. The Agency recognizes the high uncertainty of this approach, and will use any valid monitoring data, especially on insects, in lieu of the nomograph values. However the monitoring data for insects were not provided.

However, while insects represent an important food item, even if insect residues were lower than residues on other food items, it does not make a significant difference, since the estimations for

seeds and other food items still exceed the LOC.

4- The registrant did not assess risk for use on citrus at 4 lbs ai/acre (single application), and brussel sprouts at 1 lb ai/acre (up to 6 applications). The Agency included these uses because they are still on the label. Eliminating uses that have the higher application rates is an excellent way to reduce risk. The Agency supports this voluntary risk mitigation effort by the registrant.

5- The registrant does not feel it is appropriate to do long term exposure estimates for a chemical like dimethoate since it has such a short foliar half-life (up to 5 days). The Agency concurs that dimethoate is not persistent. However, it is appropriate to attempt to estimate the long term residues; especially for a chemical like dimethoate. This is valuable on the one hand because many registered dimethoate uses involve repeat applications, and on the other hand, it is useful in showing that with fewer repeat applications, or especially with single applications, that the residue levels on food items do quickly decline to below hazardous levels thus making these single use applications more desirable than multiple applications.

Conclusion:

The registrant's risk evaluation (November 9, 1998) differs from Agency's assessment because of some differences in assumptions. The conclusions for acute risk differ little, but they conclude little or no chronic risk to birds and mammals, while Agency concludes that sublethal or reproductive
risk to birds and mammals is moderate based on both peak and time-dissipated exposure values.

C. Comments Regarding EPA's incorporation of use rates and percent crop treated.

Comment: Several growers associations and univeristies stated that the use rates and percent crop treated estimates that EPA used in the risk assessments result in overestimates of exposure.

Response: The Agency uses percent crop treated data from several sources including USDA and DOANE. As additional data becomes available, the Agency will incorporate it into our exposure estimates, as appropriate. Since EPA is charged with protecting the public's health, the estimates are intended to be conservative.

Part II: Non-Chemical-Specific Comments and Responses

Non-chemical-specific comments were received from: Idaho Farm Bureau Federation; National Cotton Council; Natural Resources Defense Council (NRDC); American Farm Bureau Federation; Fish and Wildlife Service, Division of Environmental Contaminants; Southern Professional Fruit Workers Conference (held at Clemson University); and 14 individuals, 13 of whom identified themselves as pest control operators (PCOs) or otherwise associated with the professional pest control industry. The other individual commentor, John Abbotts, provided no organizational affiliation.

Because there are several recurring issues in the comments that were submitted, we have chosen to divide our responses into two sub-sections. In order to avoid repetition, sub-section A deals with comments that are closely related and were repeated in more than one of the submissions, and with comments that are testimonial in nature. Sub-section B responds to those comments that are unique to each submission and refers the reader to the appropriate common responses in sub-section A.

A. EPA Responses to Recurring Issues in the Non-Chemical-Specific Comments

1. Comments Related to Common Mechanism of Toxicity

Comments: Several commentors, including the NRDC and Private Citizen Abbotts, questioned why EPA has not considered a common mechanism of toxicity in these OP risk assessments.

Response: EPA is required under FQPA to consider available information on the effects of cumulative exposure to the pesticide and other substances with common mechanisms of toxicity. EPA believes that the organophosphate pesticides should be considered to operate via a common mechanism of toxicity, cholinesterase inhibition, unless and until the Agency receives data demonstrating otherwise.

In the Federal Register of August 6, 1998 (63 FR 42031), EPA issued a notice announcing the availability of the proposed EPA pesticide policy guidance document entitled "Guidance for Identifying Pesticide Chemicals That Have a Common Mechanism of Toxicity for Use in Assessing the Cumulative Toxic Effects of Pesticides." The guidance document describes the approach that EPA proposes to use for identifying and categorizing pesticide chemicals that have a common mechanism of toxicity for purposes of assessing the cumulative toxic effects of such pesticides. The 60-day comment period ended October 8, 1998. The revised guidance was issued in February, 1999. In developing this document, the Agency solicited advice from the FIFRA Scientific Advisory Panel (SAP) in February 1997; a year later (March 1998), OPP reported its progress to the SAP.

With respect to the comments that EPA has not considered common mechanism in these assessments, the Agency acknowledges that it has not yet performed a cumulative risk assessment, because the methodology for conducting such assessments is still being developed. Since there are currently no standard methods for doing cumulative risk assessment, EPA is pursuing an open, peer-reviewed process to develop approaches to cumulative risk assessment. The Agency is also nearing completion of the revision of the Chemical Mixtures Risk Assessment Guidelines, which present methods for combining risks from multiple chemicals. In addition, the International Life Sciences Institute (ILSI) is independently exploring appropriate methods and developing a framework for performing a cumulative risk assessment. ILSI held a workshop on this subject in September 1998, and recently submitted a report to the Agency outlining its findings. The Agency will continue its ongoing efforts in this area along with examining the ILSI

work and other sources of information in preparation for release of an Agency draft guidance document. This guidance document is currently scheduled for late summer/early fall of 1999 with a 60-day comment period.

Until a method is available, EPA intends to complete risk assessments for individual OPs and proceed with the public process for development of risk mitigation strategies.

2. Comments Related to Additional Data and Default Assumptions

Comments: The American Farm Bureau Federation, The National Cotton Council and Private Citizen Abbotts encouraged EPA to obtain the data necessary to conduct realistic risk assessments. A common theme was that EPA should use actual data, particularly usage data, and avoid default assumptions in its assessments. Private Citizen Abbotts encouraged EPA to cancel all registrations, rather than make assumptions, when required data are missing.

Response: In phase four of reregistration, EPA exercised its data call-in authority to require studies to upgrade chemical databases to current scientific standards. Most of the OPs were subject to reregistration DCIs and registrants have been allowed ample time to submit those studies. EPA makes its reregistration and tolerance reassessment decisions on the best data that are available. Where data are incomplete EPA may compensate by using an additional uncertainty factor or making a reasonable health-protective assumption. This has long been EPA practice, and is reinforced by FQPA's emphasis on the importance of the use of an additional safety factor where data are incomplete.

It should be noted, however, that the OP risk assessments that were in the docket at the time this comment was submitted were "preliminary," and that many of the first assessments were completed prior to receipt of all data. During the public comment and response period, EPA has continued its evaluations of available data, e.g., Monte Carlo analyses and other data, for these seven chemicals, and these evaluations have been incorporated into the refined risk assessments. In general, if additional, pertinent data are submitted prior to or during the comment periods, EPA will take these data into account in its revised assessments.

For a discussion of the sources of use and usage data and how EPA employs these data in its assessments, the reader is referred to a science policy paper entitled, "The Role of Use-Related Information in Pesticide Risk Assessment and Risk Management." An FR Notice announcing the availability of this paper for a 60-day public comment period was published July 14, 1999. The draft document is available on EPA's web page at: http://www.epa.gov/oppfead1/trac/science.

3. Comments Related to Application of the FQPA 10X Safety Factor

Comments: The NRDC commented that EPA failed to demonstrate the existence of reliable data for most OPs to justify departure from the use of the FQPA 10X safety factor. They also

requested that EPA offer an explanation as to why the additional safety factor should not be retained for all OPs that are not supported by a developmental neurotoxicity study.

Response: OPP has developed criteria for retaining, reducing, and removing the additional ten-fold safety factor provided for in the FQPA to account for special susceptibility of infants and children to the effects of pesticide exposures. These criteria involve a weight-of-evidence consideration of both the nature and severity of effects observed in young animals, as well as the adequacy of the data base for the chemical. OPP's rationale for these criteria has been reviewed at various stages of development by the Scientific Advisory Panel (SAP). OPP has completed a draft Standard Operating Procedure (SOP) that provides procedural guidance at the working level for making recommendations for retaining or modifying the 10-fold factor.

In addition, an Intra-Agency workgroup is looking at general considerations regarding the FQPA safety factor decisions such as: establishing procedures for consistency and documentation; ensuring the adequacy of the data set for decision-making; and establishing criteria for retaining or modifying the FQPA factor.

The Agency's policy for applying the FQPA 10-fold safety factor is currently one of the science policy issues available for public comment. Both the SOP and the Intra-Agency workgroup draft guidance document were discussed at the May, 1999, SAP meeting. An FR notice announcing the availability of these documents was published on July 8, 1999. The deadline for comments has been extended to October 7, 1999.

The question of what constitutes a reliable data base for making decisions related to the FQPA safety factor is being thoroughly reviewed. Once that review process is completed, EPA may need to revisit its SOPs and decide how best to incorporate the revised procedures into its ongoing decision making process.

It should be noted the EPA has recently (September 10, 1999) issued a Data Call-In (DCI) notice for all OP pesticides with food uses to fill any existing data gaps for acute, subchronic and developmental neurotoxicity data. This first notice will be followed shortly by other similar DCIs for these same data for other classes of chemicals known to be neurotoxic.

4. Comments Related to Highly Exposed Populations

Comments: NRDC noted that EPA failed to consider the increased potential for pesticide exposure to "sentinel" populations, such as farm worker children.

Response: NRDC has petitioned the Agency to designate farm children as a major identifiable subgroup under the FQPA. The Agency is currently evaluating the scientific and legal issues raised in that petition. Specifically related to the preliminary risk assessment for the first OPs, EPA acknowledges that exposures to farm worker children were not evaluated separately, i.e., as

a distinct population sub-group. However, based on the limited data currently available to characterize actual pesticide exposure to children of agricultural workers, such as a 1997 biomonitoring study by Loewenherz, Fenske and others (Environ. Health Perspect. 105:1344-1353), we believe that the exposure estimates developed by EPA using the Agency's Residential Exposure SOPs and other available information are reasonably inclusive of the exposures likely to be experienced by this sub-group.

EPA is concerned about the disproportionate exposure of farm children to pesticides and has several ongoing projects designed to both assess and reduce these exposures. Some of EPA's major efforts in this area are described below.

EPA's major external research program, Science to Achieve Results (STAR) program allocated funds in fiscal year 1996 for three years of research on the most urgent issues regarding exposure of children to pesticides. The studies are looking at major ways children can be exposed (touching, eating, crawling, etc.) and at seasonal and locational differences, including agricultural settings. This research will support regulations and public education efforts that are more fully protective of children, for example through revised use restrictions and labeling requirements, and improved training and public information materials. Under the STAR program, the University of Arizona is assessing exposure of the children of seasonal and migrant laborers to agricultural pesticides. In addition, the University of Washington is assessing on a comprehensive seasonal basis, children's exposures to organophosphate pesticides.

EPA's National Center for Environmental Research and Quality Assurance of the Office of Research and Development is funding a grant with the University of California at Berkeley for a five-year study, that began in August 1998, to quantify the exposure of children in agricultural areas of California to pesticides. The project will integrate biological research with community-based intervention efforts. The study will determine the impacts of pesticide exposure on children's growth and development. The University will also work with the farm worker community to investigate approaches for reducing these exposures.

Finally, based on recommendations from the Children's Health Protection Advisory Committee (CHPAC), EPA has committed to conduct a national assessment of implementation and enforcement of the Worker Protection Standard, including its effectiveness in addressing the safety needs of women and children in the agricultural setting.

5. Comments Related to Relying on Sound Science

Comments: The National Cotton Council, American Farm Bureau Federation and Private Citizen Abbotts all supported EPA's reliance on sound science to make regulatory decisions. The National Cotton Council encouraged the Agency to finalize the nine science policy issues identified during the Tolerance Reassessment Advisory Committee (TRAC) before making regulatory decisions.

Response: EPA is committed to the principles outlined by Vice President Gore to have an open and transparent process, a reasonable transition to alternative products, and the use of sound science. It is primarily for that reason that the TRAC was formed and the pilot process for increased public participation in pesticide decisions was developed. However, EPA must balance the goal of providing for greater transparency and participation in development of science policy with its mission to ensure the safety of the food supply and the health of consumers, especially children, workers, and the environment. In order to accomplish our mission through timely decision making, EPA has established an ambitious schedule for completion of individual OP risk assessments and development of risk mitigation options. It should also be noted that FQPA does establish a statutory deadline to complete the reassessment of existing tolerances by 2006, and the Agency is making every effort to comply with that deadline.

6. Comments Related to a Transparent Process

Comments: The National Cotton Council, American Farm Bureau Federation, Natural Resources Defense Council (NRDC) and Private Citizen Abbotts applauded EPA's efforts to make a transparent process for the reregistration of the organophosphate pesticides. NRDC felt that further efforts were needed to ensure that all risk assessment methods used to establish tolerances (e.g. Monte Carlo methods and underlying assumptions) were transparent. Private Citizen Abbotts noted that the formats for risk assessments were not always consistent, that the "bottom line" risk could not always be determined, and that a table summarizing risks for all OPs would help in making risk management decisions.

Response: EPA agrees that a transparent process is essential to public participation and sound decision making. The Tolerance Reassessment Advisory Committee (TRAC) was established to ensure that the process for the reregistration of the organophosphate pesticides was transparent and open to all. EPA intends to continue its dialogue with the various constituents throughout the reregistration process.

EPA acknowledges inconsistencies in the assessments for the first 16 OPs. In many cases, the assessments were begun many months ago and have not been constantly updated to reflect new formats. In the revised risk assessments, we have made an effort to ensure consistency in the assumptions and the levels of refinement that are applied, given the data for each chemical. In an attempt to make the risk assessments easier to understand and compare, EPA has prepared risk summary and overview documents for each OP. These risk overview documents have been prepared in a standard, logical format and are intended to assist the reader by identifying key features and findings of the risk assessments, highlighting any assumptions and refinements that have been used, and discussing ways of further refining the risk assessments.

7. Comments Related to Transitioning to Safer Alternatives

Comments: American Farm Bureau Federation expressed concern that EPA administer FQPA in a practical and realistic way by allowing sufficient transition time for users to adapt to new or alternative products and practices. In his comments, Private Citizen Abbotts advocated linking approval of safer chemicals with cancellation of corresponding "older, riskier alternatives."

Response: EPA's Registration Division has established a priority plan intended to encourage and expedite the registration of reduced risk pesticides and, particularly, alternatives to the OPs. However, this priority plan is not "linked" to cancellation of specific "older, riskier, alternatives." To do so would likely slow down both processes. In some cases, there may already be preferable alternatives, and thus no need to wait for a new reduced risk registration. Conversely, when a safer chemical is registered, it may take several years of use on actual field crops before its ability to completely replace another chemical is known and recognized.

With regard to the American Farm Bureau's concern, EPA is working closely with USDA and grower groups in developing risk mitigation and transition strategies.

APPENDIX 1 (from HED response)

Table: Maximum use rates proposed by Cheminova (letter dated 5/21/97) which are different from the maximum use rates considered in the development of the Residue Chemistry Chapter for the Dimethoate RED document and preliminary risk assessments.

Crop group/Crop	Maximum Application Rate (lb ai/A)		Maximum No. of Applications		Maximum Seasonal Application Rate		Application Interval (days)		Pre-harvest Interval (days)	
	Proposed	Considered in RED	Proposed	Considered in RED	Proposed	Considered in RED	Proposed	Considered in RED	Proposed	Considered in RED
Field Corn	0.5	0.5	3	3/crop cycle	1.5	not specified	7	not specified	14 (forage) 28 (grain)	14 (forage) 42 (grain)
Wheat	0.67	0.34	2	2/crop cycle	1.34	not specified	5	not specified	60	14
Grapefruit	0.5 foliar (1.0 soil drench)	2.0	0.5 foliar (1.0 soil drench)	2	1.0	4.0	31	not specified	15 (45 for scale)	15 (45 for scale)
Lemons							15	not specified		
Oranges							31	not specified		
Tangerines							15	not specified		
Watermelon	0.5	0.5	2	not specified	1.0	not specified	7	not specified	3	7
Alfalfa	0.5	0.5	1/cutting	1/crop cycle	0.5/cutting	not specified	7	not specified	10	28
Apples	0.5	0.5	3	not specified	1.5	not specified	7	not specified	35	28
Potatoes	0.5	0.5	2	not specified	1.0	not specified	7	as needed	0	7
Cherries (SLN registrations)	0.33	1.0	1	1	0.33	1	n/a	n/a	21	21